Welcome to the Illinois Century Network

ICN Service Description for K-12

December 2022 v1.8

TABLE OF CONTENTS

1 INTRODUCTION 3

2 ILLINOIS CENTURY NETWORK 4

2.1 ICN AND PUBLIC K-12 CONNECTION ARCHITECTURE 4

2.2 ICN SERVICE DESCRIPTIONS 5

2.2.1 Public Internet and ICN State Intranet Access 5

2.2.2 Security 5

2.2.3 Last Mile and WAN Circuits 6

3 HOW TO RECEIVE ICN SERVICES 7

3.1 POINT TO POINT CONNECTION TO THE ICN 8

4 PROVIDERS WITH AN INTERCONNECT TO THE ICN 8

5 ICN POINT OF PRESENCE LOCATIONS 9

6 FURTHER RESOURCES 9

1 Introduction

The Illinois Century Network (ICN) is owned and operated by Illinois Department of Innovation and Technology (DoIT), an Illinois state agency, and provides Internet access and broadband services to over 4000 Illinois institutions including K-12, libraries, higher education, community colleges, state agencies and local municipalities.

All public K-12 in Illinois are eligible to receive ICN services at no charge, with costs covered by the E-rate program and state funding. ICN services includes Internet access, broadband connections and security services. Security services includes auto distributed denial of service mitigation, centralized firewall, K-12 traffic separation, Cisco Umbrella DNS based content and security filtering and vulnerability scans.

Information provided in this document includes:

- ICN Overview
- ICN and Public K-12 typical connection architecture
- ICN Service Descriptions
- How to Receive ICN Services

If you have any questions regarding connecting to the ICN please email DoIT.ICN.K12@illinois.gov.

2 Illinois Century Network

The ICN is the Illinois state network owned, operated and maintained by the Illinois Department of Innovation and Technology (DoIT), an Illinois state agency. The ICN provides high speed broadband communication services and secure access to the public Internet for K-12, libraries, higher education, community colleges, state agencies and local municipalities ("ICN Customers"). Over 4000 customers are connected to the ICN. The principal method of connection is via a "last mile service provider" or "service provider" that connects from the customer location to an ICN point of presence (POP). There are 14 ICN POP's in Illinois, where many Illinois service providers already have an interconnect to the ICN.

2.1 ICN and Public K-12 Connection Architecture

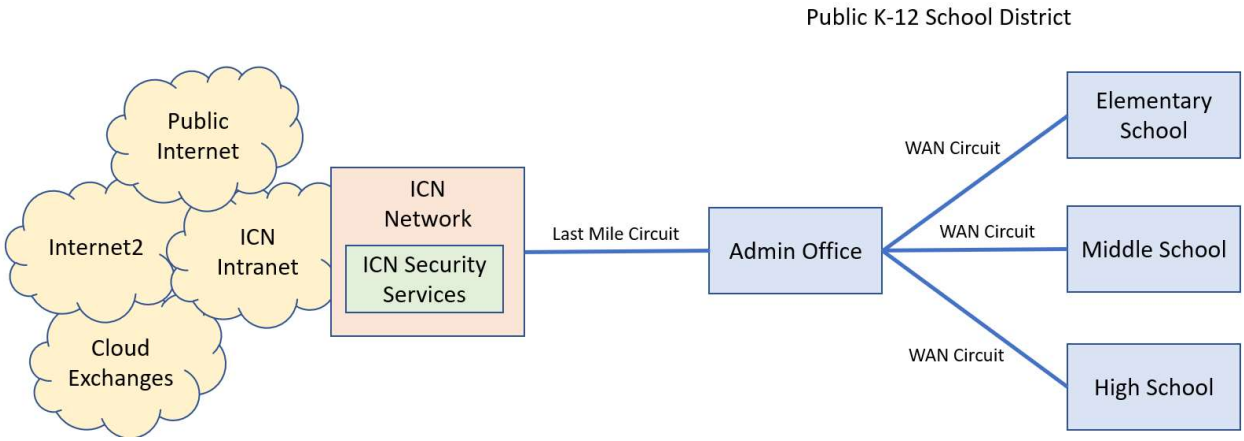

Figure 1. Public K-12 School District connection to ICN

Figure 1 shows the architecture for public K-12 connection to the ICN. The Last Mile circuit is from the school district head end or administration office to the ICN. The Last Mile circuit would connect to an ICN point of presence (POP). Wide Area Network or WAN circuits are circuits between school locations. For example, in Figure 1, there are 3 WAN circuits, between the Elementary School, Middle School and High School and the Admin Office.

ICN Services are provided at no charge. ICN Services consist of:

- Public Internet access
- ICN state intranet access
- Private point to point connections
- Auto Distributed Denial of service mitigation
- Centralized Firewall – ICN hosted
- Cisco Umbrella
- Vulnerability Scans
- Last Mile and WAN circuits

These services are referred to as ICN Services throughout this document.

2.2 ICN Service Descriptions

2.2.1 Public Internet and ICN State Intranet Access

The ICN provides secure optimized access to the Internet and communication services. The ICN is focused on providing best in class service to Illinois customers, and is optimized to provide reliable, low latency and high quality of service access to the Internet.

Optimized access to the Internet is enabled by:

- The presence of cache servers at the Springfield and Chicago POP's
- Direct traffic peering with 94 entities, reducing need to traverse the public Internet for access to common web destinations
    - For example, ICN provides direct peering with major content delivery networks such as Facebook, Microsoft, Google, Apple and Amazon providing a shorter path and secure direct connectivity to cloud based services.
- Direct connection to Internet2, the high speed research and education network
- Upstream Internet Egress purchased from Sprint, AT&T, Cogent and GTT at Chicago, Springfield and St Louis providing access to the worldwide public Internet

Regarding quantity of bandwidth available from ICN for the public K-12, as much bandwidth as required by the public K-12 for their learning needs is available. To implement one to one device programs in a media rich environment, current industry guidance ranges from 1 to 3 Mbps per student for total Internet bandwidth needed.

Private point to point connections

Via the ICN, point to point connections can be established between locations connected to the ICN, as required by the public K-12. For example, a point to point connection could be established between the school location and a "cloud exchange" allowing the school secure access to cloud services from Google, Microsoft, Amazon and others. Or if the public K-12 is working directly with a Higher Education institution, then a dedicated, private point to point link could be established between the two locations.

2.2.2 Security

Security services include auto distributed denial of service (auto DDOS) mitigation, centralized firewall, traffic separation, Cisco Umbrella DNS-based filtering and Vulnerability scans.

Auto Distributed Denial of Service Mitigation

According to Netscout (https://www.netscout.com/what-is/ddos-attack), the vendor for ICN's auto DDOS mitigation infrastructure,

DDOS attacks are programmatically generated attacks intended to disrupt the availability of applications, services, data, content, and/or infrastructure to legitimate users of those entities. They are

attacks against capacity and/or state, and are generated using multi-node botnets, bespoke attack infrastructure and/or DDOS-for-hire services.

ICN's DDOS mitigation infrastructure blocks inbound (towards the public K-12) DDOS attacks thus protecting the availability of the K-12 network and services. The ICN mitigation infrastructure also blocks outbound communication from compromised internal devices to attacker command and control devices. This stops the proliferation of malware within the K-12 network and ultimately avoids a data breach.

Centralized Firewall

All public K-12 traffic is protected via ICN centralized firewalls. Traffic to and from public K-12 traverses the firewall ensuring "clean" data flows. By design, the firewall policies on the centralized firewall are coarse ensuring no interworking issues with school specific data flows. However, the firewall does actively monitor and block "indicators of compromise" such as ransomware and "command and control" botnet server communication. The firewall also provides advanced protections via Intrusion Prevention and Anti-Virus systems.

Public K-12 Traffic Separation

Public K-12 traffic on the ICN is separated from other customer traffic thus increasing the protection against cyberattacks.

Cisco Umbrella

Cisco Umbrella is a DNS layer security and content filtering solution. Malicious and unwanted domains, IP addresses, and cloud applications are blocked before a connection is ever established. Further information on the Cisco Umbrella solution is available at https://umbrella.cisco.com. Two Cisco Umbrella training webinars were recently completed specifically for ICN customers, and these are available at www.illinois.gov/k12broadband.

Vulnerability Scans

Public K-12 customers of ICN may request Vulnerability Scans of their network using Nessus tools and dynamic reports, provided at no charge.

2.2.3 Last Mile and WAN Circuits

Last Mile and WAN circuits, as shown in Figure 1 are provided at no charge to public K-12. These circuits are implemented by third party service providers. To determine which service provider will implement a circuit, an E-rate compliant procurement is issued. The procurement process is managed by Illinois Department of Innovation and Technology (DoIT), an Illinois state agency, and the resulting contract is between the service provider and DoIT. Bandwidth available is up to 10 Gbps and beyond, as required by the school district for K-12 digital learning needs. Funding for circuits is provided by E-rate and state appropriation, such that there is no out of pocket cost from the school district.

Although the circuits are implemented by service providers, support calls are directed to the ICN Network Operations Center (NOC). The ICN NOC will then coordinate with the service provider and school to address the issue.

To include circuits in a procurement, DoIT needs to know the end point locations. This is provided by the school district using a simple online tool. Further details on how to access the tool is given in section 3 below.

3 How to Receive ICN Services

To benefit from Internet, broadband connectivity and security services at no charge, please see instructions below.

First step is to sign a K-12 Letter of Agency. Please email DoIT.ICN.K12@illinois.gov requesting a Letter of Agency. DoIT will then email a Letter of Agency for you to digitally sign.

The Letter of Agency allows the consortium to solicit and procure circuits on your behalf. The Letter of Agency is required by E-rate rules. Please note that signing a Letter of Agency does not limit or remove your ability to file your own E-rate forms and issue your own procurement.

To check if your school district has previously signed a Letter of Agency, please go to www.illinois.gov/k12broadband then under "Resources" select the link "Consortium LOAs Received" to download a spreadsheet. If your school district is listed in the spreadsheet, you do not need to sign another Letter of Agency.

Second step is to provide to the consortium your broadband circuits. This is done via a simple online tool. We pull address information from the E-rate database, so you will not need to type out addresses. Please first watch the short 10 minute instructions video before using the tool. The link to the tool is at www.illinois.gov/k12broadband then under "Forms and Tools" are the links for: "Consortium Data Collection Tool" and "Consortium Data Collection Tool Instructions (Video)" Please view the "Creating New Circuits Video".

Once the consortium receives your circuit information, eligible circuits will be included in the procurement to be issued approximately August 2023 timeframe. This will be for service from July 1, 2024 to June 30, 2025 and from July 1, 2025 to June 30, 2026.

An eligible circuit is either not in a term contract or in a term contract that completes prior to June 30, 2026. The consortium does not allow circuits already in a contract to be terminated early (with early termination fees) to then join the consortium.

Please email DoIT.ICN.K12@illinois.gov if you have any questions.

3.1 Point to Point Connection to the ICN

An alternative approach to the two steps given in this section, is to procure your own point to point circuit to the ICN. This allows you to benefit, at no charge, from ICN Internet and security services once connected. The connection can be made at any time and could be used as your primary or backup circuit as desired. As much bandwidth as required is available from the ICN. Connection to the ICN means connecting to an ICN Point of Presence (POP) location. The list of providers that already have an interconnect to the ICN is given in section 4 and the list of ICN POP locations is given in section 5. If your provider is not already connected to the ICN, the provider should contact ICN and we will facilitate the interconnection. There is no charge to the provider for interconnection.

4 Providers with an Interconnect to the ICN

The list of providers that currently have an interconnect to the ICN are shown in the below table. This table is for information only. Providers not in the below table wishing to interconnect to the ICN, can contact ICN at 214 792 9866 or essam.el-beik@illinois.gov

Adams TelSystems Inc	MCC Network Services
AT&T	McDonough Telephone
Bluebird Network	Mediacom
CIRBN, LLC	Northern Illinois University
Comcast	Shawnee Telephone
Consolidated Communications, Inc	Spectrum
Delta Communications DBA Clearwave	Sparklight
Frontier Communications	Stratus Networks Inc
Futiva, LLC	Syndeo
Grafton Telephone	UC2B
Harrisonville Telephone	Vero Fiber Networks
Illinois Fiber Resources Group, NFP dba iFiber	Wabash Independent Networks Inc
Illinois Rural Health Network (IRHN)	Windstream
Madison Communications	

5 ICN Point of Presence Locations

A service provider can consider any of the ICN POP locations listed below as an available location to connect to the ICN. This list is available as a separate PDF document at www.illinois.gov/k12broadband under Resources, at the link "ICN POP List".

Title	Site Name	Address	State	City	Zip Code
Carbondale POP	Southern Illinois University	1255 Lincoln Drive	IL	Carbondale	62901
Champaign POP	University of Illinois - Urbana Champaign	202 E Peabody Dr	IL	Champaign	61820-6980
Charleston POP	Eastern Illinois University	1666 7th Street	IL	Charleston	61920-3099
Chicago POP	State Office Building	160 N. Lasalle	IL	Chicago	60601-3103
Collinsville POP	State Office Building	1100 E. Port Plaza	IL	Collinsville	62234-6102
DeKalb POP	Northern Illinois University	375 Wirtz Drive	IL	DeKalb	60115-2853
Macomb POP	Western Illinois University	1 University Circle	IL	Macomb	61455-1367
Moline POP	Western Illinois University	3300 River Dr	IL	Moline	61265
Normal POP	Illinois State University	300 S SCHOOL ST	IL	Normal	61761-2506
Olney POP	Richland County Courthouse	103 W. Main St	IL	Olney	62450-2170
Peoria POP	Illinois Century Network	211 B S.W. Adams	IL	Peoria	61602-1450
Quincy POP	John Wood Community College	1301 S. 48Th Street	IL	Quincy	62305-8736
Rockford POP	EJ Zeke Giorgi Center	200 South Wyman Street	IL	Rockford	61101-1231
Springfield POP	Illinois Century Network Data Center	201 W. Adams	IL	Springfield	62701-1100

6 Further Resources

Further information on the Illinois K-12 Broadband Network and the DoIT E-rate Consortium is available at www.illinois.gov/k12broadband.

If you have any questions regarding connecting to the ICN please email DoIT.ICN.K12@illinois.gov.